ASYMMETRIC GROUP 8 (VIII) METALLOCENE COMPOUNDS

ABSTACT OF THE DISCLOSURE

Asymmetric, disubstituted metallocene compounds have the general formula
5   CpMCp' where M is a metal selected from the group consisting of Ru, Os and Fe; Cp is
a first substituted cyclopentadienyl or indenyl moiety that includes at least one
substituent group D_1; Cp' is a second substituted cyclopentadienyl or indenyl moiety
that includes at least one substituent group D_1'. D_1 is different from D_1'. D_1 is X;
$C_{a1}H_{b1}X_{c1}$; $C_{a2}H_{b2}X_{c2}(C=O)C_{a1}H_{b1}X_{c1}$; or $C_{a2}H_{b2}X_{c2}OC_{a1}H_{b1}X_{c1}$, where X is a halogen
10   atom or nitro group; a1 is an integer between 2 and 8; b1 is an integer between 0 and
2(a1)+1-c1; c1 is an integer between 0 and 2(a1)+1 − b1; b1 + c1 is at least 1; a2 is an
integer between 0 and 8; b2 is an integer between 0 and 2(a2) + 1 − c2; andc2 is an
integer between 0 and 2(a2) + 1 − b2; and D1' is X; $C_{a1}H_{b1}X_{c1}$;
$C_{a2}H_{b2}X_{c2}(C=O)C_{a1}H_{b1}X_{c1}$; or $C_{a2}H_{b2}X_{c2}OC_{a1}H_{b1}X_{c1}$, where X is a halogen atom or
15   nitro group; a1 is an integer between 1 and 8; b1 is an integer between 0 and 2(a1)+1-
c1; c1 is an integer between 0 and 2(a1)+1 − b1; b1 + c1 is at least 1; a2 is an integer
between 0 and 8; b2 is an integer between 0 and 2(a2) + 1 − c2; andc2 is an integer
between 0 and 2(a2) + 1 − b2. The compounds can be employed as precursors in film
deposition processes.